

## Healthcare-associated infections and multidrug-resistant bacteria

In the hospital, patients can sometimes become infected with common and unusual germs (bacteria, fungi, and viruses). These are called healthcare-associated infections. Sometimes these infections are serious, and in rare situations, they can be deadly.

At the Clinical Center, we work hard to decrease the risk of healthcare-associated infections, but these infections continue to occur in all hospitals, including ours.

### Multidrug-resistant bacteria

Over recent years, bacteria that have developed resistance to more than one antibiotic (called *multidrug-resistant bacteria*) have caused some healthcare-associated infections. This type of infection is more common in people who are very ill or have severely weakened immune systems requiring frequent use of antibiotics. The Clinical Center, like other hospitals that serve patients who are seriously ill with weakened immune systems, has had to manage several types of multidrug-resistant bacteria.

#### Types of multidrug-resistant bacteria

Examples of multidrug-resistant bacteria include: Vancomycin-resistant Enterococci (VRE), multidrug-resistant *Acinetobacter baumannii* (MDRAB), extended-spectrum beta-lactamase-producing bacteria (ESBL), and carbapenem-resistant organisms (CRE, which can include bacteria such as KPC-*Klebsiella* or KPC-*E.coli*).

Multidrug-resistant bacteria can spread from patient to patient on the hands of healthcare personnel or on contaminated surfaces, such as bed rails, hand rails, bedside tables, and medical equipment. Doctors, nurses, and other hospital staff carefully follow infection control precautions recommended by the CDC to prevent the spread of these bacteria.

These include:

- Disinfecting hands with soap and water or an alcohol-based hand sanitizer before and after caring for **each** patient;
- Wearing gloves and a gown before entering the room of a patient who has multidrug-resistant bacteria, and removing gloves and gown and cleaning hands upon exiting;
- Keeping patients who have multidrug-resistant bacteria on isolation in private rooms;
- Educating patients and staff about these infections and about how and to whom they are spread;
- Carefully cleaning and disinfecting rooms and medical equipment;
- Testing patients for these bacteria to detect them early and help prevent them from being passed on to other patients.

While you are in the Clinical Center, you will most likely have cultures collected on admission and then periodically to find out whether you carry multidrug-resistant bacteria. Some hospital wards collect these cultures every few days; others collect them monthly. If you are found to be carrying the bacteria, we will place you on the precautions described above to reduce the risk for further spread in the hospital.

## Carbapenem-Resistant Organisms

Carbapenem-resistant organisms, commonly called CRE, are bacteria (such as KPC-*Klebsiella* and KPC-*E.coli*) that can cause infections that are very difficult to treat. They are resistant to many antibiotics and are becoming more common in hospitals around the world.

Healthy people usually do not get a CRE infection. Patients who need long hospital stays, have severely weakened immune systems, or who are critically ill are more likely to get an infection. Patients may be exposed to CRE when they are on ventilators, have intravenous catheters or open wounds. Unfortunately, medical devices may allow CRE to enter the body and cause an infection. CRE bacteria can be spread in the hospital through person-to-person contact. They can also be spread via contaminated equipment or environment. CRE bacteria do not spread through the air.

In some people, after exposure to bacteria like CRE, the bacteria sit quietly alongside the normal bacteria in the gastrointestinal tract but do not cause infection (this is called **colonization**). Colonized patients can still spread CRE to others in the hospital. In some colonized people who have severely weakened immune systems requiring frequent use of antibiotics, CRE can enter the body and cause **infections** such as pneumonia or bloodstream infections.

### What can you do as a patient or loved one of a patient?

**Be informed. Be empowered. Be prepared.**

- **Speak up.** Talk to your doctor about any concerns you have about your safety. Ask your doctors and nurses what they are doing to protect you and what you can do.
- **Tell your healthcare provider** if you currently have multidrug-resistant bacteria or if you have ever had multidrug-resistant bacteria.
- **Keep your hands clean.** Remind your providers to clean their hands, and ask your family members and visitors to do the same with either soap and water or alcohol-based hand gel.
- **Ask your doctors and nurses about your care.** For example, ask if you still need an intravenous catheter or a urinary catheter. Leaving these catheters in place can increase the chances of getting an infection.
- **Know the signs and symptoms of infection**, such as fever; chills; or redness, pain, or drainage at an I.V. catheter site or surgical incision site. Tell your doctor immediately if you have these symptoms.

### Questions?

If you have questions, please contact your doctor or a member of your healthcare team.

This information is prepared specifically for persons taking part in clinical research at the National Institutes of Health Clinical Center and may not apply to patients elsewhere. If you have questions about the information presented here, talk to a member of your health care team.

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Questions about the Clinical Center?  
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